UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

August 23, 2018

EA–18–104

Mr. Bryan C. Hanson
Senior VP, Exelon Generation Company, LLC
President and CNO, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION—NRC SPECIAL INSPECTION REPORT 05000461/2018050

Dear Mr. Hanson:

On June 29, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed a reactive inspection at your Clinton Power Station. On August 3, 2018, the NRC inspectors discussed the results of this inspection with Mr. T. Stoner and other members of your staff. The results of this inspection are documented in the enclosed report.

Based on the results of this inspection, the NRC identified two issues that were evaluated under the risk significance determination process. Both of these issues were determined as having very-low safety significance (Green). The NRC has also determined that two violations are associated with these issues. Because the licensee initiated condition reports to address these issues, these violations are being treated as Non-Cited Violations (NCVs), consistent with Section 2.3.2 of the Enforcement Policy. These NCVs are described in the subject inspection report.

Additionally, Results Section (4) of the enclosed report discusses a finding with an associated apparent violation for which the NRC has not reached a preliminary significance determination. This finding involved the apparent failure of licensee personnel to follow multiple procedures resulting in the unavailability of the Division 2 Emergency Diesel Generator when it was relied upon for plant safety. Since the NRC has not made a final determination in this matter, a Notice of Violation is not being issued for this inspection finding at this time. In addition, please be advised that the characterization of the apparent violation described in the enclosed inspection report may change as a result of further NRC review.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555–0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC Resident Inspector at the Clinton Power Station.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555–0001; with copies to the Regional Administrator, Region III; and the NRC resident inspector at Clinton Power Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Karla Stoedter, Chief
Branch 1
Division of Reactor Projects

Docket No. 50–461
License No. NPF–62

Enclosure:
Inspection Report 05000461/2018050

cc: Distribution via LISTSERV®

Letter to Bryan Hanson from Karla Stoedter dated August 23, 2018

SUBJECT: CLINTON POWER STATION—NRC SPECIAL INSPECTION REPORT 05000461/2018050

DISTRIBUTION:
Jeremy Bowen
RidsNrrDorlLpl3
RidsNrrPMClinton Resource
RidsNrrDirsIrib Resource
Steven West
Darrell Roberts
Richard Skokowski
Allan Barker
DRSIII
DRPIII
ROPassessment.Resource@nrc.gov

ADAMS Accession Number: ML18235A170

OFFICE	RIII		RIII		RIII			
NAME	CPhillips:bw		RSkokowski		KStoedter			
DATE	8/15/2018		8/15/2018		8/23/2018			

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Numbers:	50–461
License Numbers:	NPF–62
Report Numbers:	05000461/2018050
Enterprise Identifier:	I–2018–050–0002
Licensee:	Exelon Generation Company, LLC
Facility:	Clinton Power Station
Location:	Clinton, IL
Dates:	June 25 through June 29, 2018
Inspectors:	C. Phillips, Project Engineer R. Murray, Senior Resident Inspector, Quad Cities J. Draper, Health Physicist
Approved by:	K. Stoedter, Chief Branch 1 Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) monitored the licensee's performance by conducting a Special Inspection at Clinton Nuclear Power Station in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. Findings and violations being considered in the NRC's assessment are summarized in the table below.

List of Findings and Violations

Failure to Follow Multiple Procedures			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	TBD AV 05000461/2018050–01 Open EA–18–104	[H.2] – Human Performance, Field Presence	93812–Special Inspection
On May 17, 2018, a To-Be-Determined (TBD) finding and an associated Apparent Violation of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and Technical Specification 3.8.2, Condition B.3, were self-revealed for the licensee's failure to follow multiple procedures that affected quality. This resulted in the unavailability and inoperability of the Division 2 Emergency Diesel Generator when it was relied upon for plant safety.			

Failure to Identify a Condition Adverse to Quality			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000461/2018050–02 Open/Closed	[H.12] – Human Performance, Avoid Complacency	93812–Special Inspection
On May 17, 2018, a Green finding and an associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," were self-revealed for the licensee's failure to promptly identify that the safety-related Division 2 Emergency Diesel Generator had its starting air receivers isolated, which was a condition adverse to quality that rendered the emergency diesel generator inoperable and unavailable.			

Equipment Operator Rounds Points Inadequate Acceptance Criteria			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000461/2018050–03 Open/Closed	[H.6] – Human Performance, Design Margins	93812–Special Inspection
On May 17, 2018, a Green finding and an associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” were self-revealed for the licensee’s failure to include appropriate quantitative acceptance criteria for the Division 2 Emergency Diesel Generator parameters to ensure the Division 2 Emergency Diesel Generator could perform its safety function.			

Additional Tracking Items

None.

INSPECTION SCOPE

Inspections were conducted using the appropriate portions of the inspection procedure (IP) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

OTHER ACTIVITIES—TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

93812—Special Inspection

In accordance with the Special Inspection Team Charter (ADAMS Accession Number ML18158A170), the inspection team conducted a detailed review of the event that led to both Division 1 and Division 2 Emergency Diesel Generators (EDGs) being inoperable and unavailable. The inspectors reviewed the following areas.

(1) Develop a complete sequence of events related to the inoperability and unavailability of the Division 1 and Division 2 alternating current (AC) power systems from May 9 through May 17, 2018. The chronology should include plant mode changes, changes in the electrical power, decay heat removal, and inventory control shutdown safety/risk areas.

(2) Understand the increased shutdown risk condition which existed when no emergency AC power sources were available for a period of approximately 3.5 days. Review the planned shutdown safety configuration compared to the actual configuration that existed. Understand the licensee's ability to respond to and mitigate a loss of offsite power event given the unavailability of both onsite emergency AC power sources.

(3) Review the licensee's cause analysis efforts and determine if the evaluation's level of detail is commensurate with the significance of the problem.

(4) Determine the probable cause(s) for the unavailability of the Division 1 and Division 2 EDGs during the 2018 refueling outage.

(5) Understand whether there were any deficiencies in operator training (both licensed and non-licensed operators) which contributed to the EDG unavailability and the failure to identify the condition across multiple operating shifts.

(6) Evaluation of the licensee's compliance with, and adequacy of, procedural guidance for performing system alignments, controlling equipment configuration, performing equipment tag-outs and control room log keeping as it pertains to the cause(s) of the event.

The inspectors identified several examples of situations where procedures and work instructions that were in place at the time of the event were not followed. These examples are discussed in detail in an observation box in the results section associated with paragraph (4) of this report.

(7) Evaluate licensee planned and completed corrective actions following the EDG event to the extent possible and assess if prior opportunities (e.g., surveillances, maintenance, and self or nuclear oversight assessments) existed to have identified the problem at an earlier point in time.

(8) Determine whether recent internal and external operating experience involving configuration control, risk management and oversight of activities were appropriately evaluated and determine the adequacy of any corrective actions planned or completed.

INSPECTION RESULTS

93812—Special Inspection

(1) Develop a complete sequence of events related to the inoperability and unavailability of the Division 1 and Division 2 AC power systems from May 9 through May 17, 2018. The chronology should include plant mode changes, changes in the electrical power, decay heat removal, and inventory control shutdown safety/risk areas.

Observation	IP 93812
On May 9, 2018, Clinton Power Station (CPS), Unit 1, was in Mode 5 during Refueling Outage C1R18. The reactor cavity was filled, and at 9:36 p.m. the Division 2 4160 Volt alternating current (Vac) bus (1B1) was energized from the reserve auxiliary transformer (RAT) to end a scheduled bus 1B1 maintenance window. The Division 1 AC distribution system, Division 1 EDG, and residual heat removal (RHR) ‘A’ system were operable during the 1B1 bus outage and remained operable upon restoration of bus 1B1. Earlier on May 9, 2018, the Division 2 EDG had been inoperable and unavailable as a result of the 1B1 bus outage. At 5:25 p.m., Clearance Order (C/O) 139455 was removed from the Division 2 EDG as part of 1B1 restoration activities. This C/O included a Special Instruction that stated “Restore Div 2 DG [diesel generator] to standby per CPS 3506.01P002 [Division 2 Diesel Generator Operations; Revision 3a] in conjunction with C/O removal.” The inspectors found procedure CPS 3506.01P002 was not performed in conjunction with the C/O closure. Instead, a senior reactor operator (SRO 1) placed a note in the control room log stating CPS 3506.01P002 needed to be performed after restoration of the Division 2 shutdown service water (SX) system. Because CPS 3506.01P002 was not completed as part of the C/O closure, the position of the Division 2 EDG air receiver isolation valves was being controlled by the control room log entry instead of through an approved licensee process. By not completing CPS 3506.01P002 at that time, Division 2 EDG air receiver isolation valves (1DG160 and 1DG161) were left shut. Following the closure of the C/O, this log entry was the only method the licensee used to track the need to restore the Division 2 EDG to standby per CPS 3506.01P002. On May 10, 2018, during the day shift, a senior reactor operator (SRO 2) directed a non-licensed operator to perform a portion of CPS 3506.01P002 to restore fuses for the Division 2 EDG lubrication system, which had previously been removed from service prior to the 1B1 bus maintenance. When the non-licensed operator had completed the partial procedure, SRO 2 had already turned over duties to a different senior reactor operator (SRO 3), so the non-licensed operator returned the partial completed procedure to SRO 3.	

Even though the complete CPS 3506.01P002 procedure had not been performed, SRO 3 believed that all activities required to restore the Division 2 EDG had been completed.

On May 11, 2018, at 2:30 a.m., SRO 3 declared the Division 2 EDG available after Division 2 SX was restored and made available. At this time, the Division 2 EDG starting air valves (1DG160 and 1DG161) remained closed, isolating starting air from the EDG air start motors, making the EDG unable to start on any demand signal. On May 11, 2018, at 5:10 a.m., the licensee installed the reactor cavity gate in preparation for cavity drain down and reactor head installation. The cavity drain began at 9:43 a.m. and was completed at 1:54 p.m. The licensee began tensioning the reactor head studs at 12:20 a.m. on May 12, 2018, and completed tensioning the studs at 1:51 a.m., at which time operations department personnel declared the Unit in Mode 4.

On May 12, 2018, at 8:00 a.m., the licensee completed OP–AA–108–106, "Equipment Return to Service," Revision 5, for the Division 2 Nuclear System Protection System (NSPS), Division 2 essential switchgear cooling (VX), Division 2 direct current (DC), and Division 2 EDG, and declared each of these systems operable. The licensee did not perform post-maintenance testing on the Division 2 EDG as no maintenance was performed on the EDG.

On May 13, 2018, operations secured the RHR 'A' pump from operation in shutdown cooling mode from 2:24 a.m. until 12:53 p.m. to facilitate the reactor pressure vessel pressure test. During this time, the emergency reserve auxiliary transformer (ERAT) (which had been unavailable since May 5, 2018, at 5:03 p.m.), the second source of offsite power to the 4160 Vac safety-related buses, was declared available at 5:15 a.m. At 11:09 p.m., RHR 'B' was declared operable for shutdown cooling mode, and at 11:28 p.m., RHR 'A' was secured and RHR 'B' was started in shutdown cooling mode.

On May 14, 2108, at 12:30 a.m., since the licensee was unaware that the Division 2 EDG was inoperable and unavailable due to its inability to start caused by the 1DG160 and 1DG161 valves being closed, the licensee began a scheduled maintenance window for the Division 1 4160 Vac bus (1A1). As a result of taking bus 1A1 out of service, the Division 1 EDG was declared inoperable and unavailable along with other equipment powered from bus 1A1, including the low pressure core spray (LPCS) and RHR 'A' systems.

On May 16, 2018, at 1:30 a.m., the licensee completed filling and venting the high pressure core spray (HPCS) system following an extended maintenance window. On May 17, 2018, at 11:18 a.m., operations declared HPCS available, and after post-maintenance testing of the system on May 18, 2018, at 6:21 p.m., HPCS was declared operable.

On May 17, 2018, at 3:03 p.m., a non-licensed operator performing shift rounds identified that the 1DG160 and 1DG161 valves were closed and reported this condition to the control room. The licensee declared the Division 2 EDG inoperable and unavailable and investigated the condition. The licensee restored the valves to the open position and declared the Division 2 EDG available at 3:45 p.m. After the licensee performed OP–AA–108–106, the licensee declared the Division 2 EDG operable at 9:04 p.m.

(2) Understand the increased shutdown risk condition which existed when no emergency AC power sources were available for a period of approximately 3.5 days. Review the planned shutdown safety configuration compared to the actual configuration that existed.

Understand the licensee’s ability to respond to and mitigate a loss of offsite power event given the unavailability of both onsite emergency AC power sources.

Observation	IP 93812
As a result of several human performance errors the Division 2 EDG was inoperable and unavailable for over 6 days without the licensee’s knowledge. Both Division 1 and Division 2 EDGs were inoperable and unavailable for over 3 days, May 14 through May 17, 2018, which was not allowed per Technical Specification (TS) 3.8.2 (this violation is in the results section of the report for Paragraph (4)). Had a loss of offsite power event occurred between May 14 and May 17, 2018, there would have been an immediate station blackout (SBO) event. The inspectors determined that the Division 2 EDG was recoverable. The inspectors determined that there were no other plant conditions that deviated from the stations shutdown risk plan during the time that both EDGs were unavailable. The inspectors determined that the licensee could have responded to an SBO in one of at least three ways. The licensee could have declared an extended loss of AC power (ELAP) event and deployed FLEX equipment. Additionally, the smaller Division 3 EDG could have been started and cross-tied to the Division 2 4160 Vac bus. The inspectors determined that the Division 3 EDG would have supported enough loads to restore one train of shutdown cooling. Finally, two diesel driven fire pumps and the safety-relief valves were available to provide feed and bleed cooling to the reactor core if necessary.	

(3) Review the licensee’s cause analysis efforts and determine if the evaluation’s level of detail is commensurate with the significance of the problem.

Observation	IP 93812
The inspectors interviewed the licensee’s root cause team lead and two additional root cause team members. At the time the inspection team arrived on site the licensee had completed their initial analysis of the events but had neither documented the results of their review nor had station management reviewed and approved the results. The inspectors reviewed numerous procedures, toured the applicable locations in the plant, and interviewed several operators involved in this event. The inspectors determined that the licensee appeared to be following their guidance for root cause investigations.	

(4) Determine the probable cause(s) for the unavailability of the Division 1 and Division 2 EDGs during the 2018 refueling outage.

Observation	IP 93812
The inspectors determined that the cause of the event was the licensee’s failure to follow multiple procedures and work instructions. The restoration instructions associated with the clearing of C/O 139455 that resulted in this event were not followed. The instructions stated that the performance of CPS 3506.01P002, “Division 2 Diesel Generator Operations,” was required to be in conjunction with the clearance of the C/O. The standard Clinton operation’s process for clearing out-of-service tags was to leave the valves in the out-of-service position and then complete a standby lineup afterwards to reposition the valves to the correct position. The SRO (SRO 1) that cleared C/O 139455 did not perform the standby lineup (CPS 3506.01P002) in conjunction with the clearing of the out-of-service because safety-related cooling water (SX) to the EDG was still inoperable. This resulted in the EDG air receiver isolation valves (1DG160 and 1DG161) remaining closed when the out-of-service cards were cleared. The inspectors asked the licensee if 1DG160 and 1DG161 needed to	

remain closed to protect the EDG based solely on the status of the safety-related cooling water to the EDG at the time. The licensee responded that it was not required for 1DG160 and 1DG161 to remain closed to protect the EDG based on the plant status at the time C/O 139455 was cleared. The failure to follow the C/O direction to complete procedure CPS 3506.01P002 was a failure to follow work instructions.

The SRO (SRO 1) stated in the control room operating logs that CPS 3506.01P002 was required to be performed at some later date. The inspectors identified that the specific abnormal positions of 1DG160 and 1DG161 were not logged into the operations log, only the requirement to complete CPS 3506.01P002. The inspectors also identified that no Exelon procedure existed that required or allowed the tracking of valves in an abnormal position by the use of the control room logs. A Clinton site specific procedure existed that allowed tracking of the status of some specific equipment in the operator logs until the end of the shift but that procedure was not applicable to this situation.

Valves 1DG160 and 1DG161 were normally locked open valves. Exelon procedure OP–AA–108–103, “Locked Equipment Program,” Revision 2, Step 4.1.5, stated, “If plant conditions require a locked component to be positioned in a manner other than that indicated on the locked equipment checklist or approved procedure, then UNLOCK and REPOSITION equipment in accordance with OP–AA–108–101, ‘Control of Equipment and System Status.’” Procedure OP–AA–108–101, “Control of Equipment and System Status,” Revision 14, Step 4.1.1.1, stated, “Utilize an ACPS [abnormal component positioning sheet] for aligning equipment outside of routine operations. For situations, excluding routine operation, where a component, system, or structure is required to be placed in a position differing from its normal lineup, the alignment must be done utilizing an Abnormal Component Position Sheet (ACPS). The ACPS will document proper evaluation, performance and restoration of the alignment, ensuring plant configuration control is maintained.” An ACPS was not used to track the positions of 1DG160 and 1DG161. This was a failure to follow procedure.

Exelon procedure OP–AA–108–106, “Equipment Return to Service,” Revision 5, Step 4.3, required that “if equipment will not be restored to the Equipment Line-up/Restoration position or the original condition, then another approved equipment status control mechanism shall be used to document equipment status (i.e. Equipment Status Tag, administrative clearance/tagout). Procedure OP–AA–108–101, ‘Control of Equipment and System Status,’ shall be used to document abnormal equipment configuration and shall be immediately applied following equipment restoration.” This was not performed and constituted a failure to follow procedure.

In addition, Exelon procedure OP–AA–109–101, “Clearance and Tagging,” Revision 12, Step 10.2.1, stated, “If a lift position is determined to be different from the normal lineup position for the present plant condition and not tracked by another C/O or procedure, then Shift Management shall be notified and equipment tracking initiated.” In an interview between the inspectors and SRO 1, he stated that he thought the positions of 1DG160 and 1DG161 were being tracked via a procedure (CPS 3506.01P002). Licensee operations management stated that entering the procedure into the operations log was not the same as tracking via procedure. Tracking the position of the air start valves by the use of another C/O or procedure was not performed and constituted a failure to follow procedure.

When the licensee restored safety-related cooling water to the EDG, a second SRO (SRO 2) directed a partial performance of CPS 3506.01P002 in order to restore fuses for control power for the EDG lube oil pumps. Per the inspectors interview with SRO 2 the fuses were pulled during a previous outage activity to prevent starting of the DC lube oil pumps when the AC power was removed for the 1B1 bus outage.

When the non-licensed operator returned with the partially performed copy of CPS 3506.01P002, he turned it over to a third SRO (SRO 3). Since procedure CPS 3506.01P002 was not marked as a partially performed procedure, SRO 3 believed it to be a fully performed procedure.

Even though the complete CPS 3506.01P002 procedure had not been performed, SRO 3 believed that all restoration activities on the Division 2 EDG had been performed. Therefore after Division 2 SX was restored and made available on May 11, 2018, SRO 3 declared the Division 2 EDG available. At this time, the Division 2 EDG starting air valves (1DG160 and 1DG161) remained closed, preventing starting air from reaching the EDG air start motors, making the EDG unable to start on any demand signal.

The next day on May 12, 2018, at 8:00 a.m., the licensee determined that OP–AA–108–106, "Equipment Return to Service," for the Division 2 NSPS, Division 2 essential switchgear cooling (VX), Division 2 direct current (DC) and Division 2 EDG, was complete and declared each of these systems operable. The licensee did not perform post-maintenance testing on the Division 2 EDG as no maintenance was performed on the EDG. The inspectors determined operating management personnel did not perform procedure OP–AA–108–106, "Equipment Return To Service," Revision 5, Step 4.4.9, which stated, "Applicable Operating procedures are complete and any equipment line-ups directed to be completed by the Operating Procedures are completed," because CPS 3506.01P002 had not been completed. In addition, licensee operations department management personnel did not perform Step 4.4.14, which stated, "The system/equipment has been walked down as appropriate to verify that it can be safely operated to fulfill its design function." The SRO told the inspectors that because no maintenance was performed on the EDG he did not think it was necessary. The failure to perform these steps was a failure to follow procedure.

Failure to Follow Multiple Procedures			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	TBD 05000261/2018050–01 Open EA–18–104	[H.2] – Human Performance, Field Presence	93812–Special Inspection

On May 17, 2018, a To-Be-Determined (TBD) finding and an associated Apparent Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and Technical Specification 3.8.2, Condition B.3, were self-revealed for the licensee's failure to follow multiple procedures that affected quality. This resulted in the unavailability and inoperability of the Division 2 Emergency Diesel Generator when it was relied upon for plant safety.

Description:

Earlier on May 9, 2018, the Division 2 EDG was inoperable and unavailable as a result of the 1B1 bus outage. At 5:25 p.m., C/O 139455 was removed from the Division 2 EDG as part of bus 1B1 restoration activities. This C/O included a Special Instruction that stated "Restore Div 2 DG to standby per CPS 3506.01P002 [Division 2 Diesel Generator Operations; Revision 3a)] in conjunction with C/O removal." This procedure (CPS 3506.01P002) was not performed prior to closure of the C/O; and an SRO (SRO 1) noted in the control room narrative logs that the Division 2 EDG remained in maintenance lockout pending restoration of the Division 2 shutdown SX system from its planned maintenance window, and that restoration per CPS 3506.01P002 would need to be performed to restore the Division 2 EDG to standby. By not completing CPS 3506.01P002, isolation valves from the EDG starting air receiver (1DG160 and 1DG161) were left shut. Following the closure of the C/O, this log entry was the only method the licensee used to track the need to restore the Division 2 EDG to standby per CPS 3506.01P002.

On May 10, 2018, during the day shift, a senior reactor operator (SRO 2) directed a non-licensed operator to perform a portion of CPS 3506.01P002 to restore fuses for the Division 2 EDG lubrication system, which had previously been removed from service prior to the 1B1 bus maintenance. When the non-licensed operator had completed the partial procedure, SRO 2 had already turned over duties to a different senior reactor operator (SRO 3), so the non-licensed operator returned the completed partial procedure to SRO 3. Even though the complete CPS 3506.01P002 procedure had not been performed, SRO 3 believed that all restoration activities had been performed. After Division 2 SX was restored and available on May 11, 2018, at 2:30 a.m., SRO 3 declared the Division 2 EDG available. At this time, the Division 2 EDG starting air valves (1DG160 and 1DG161) remained closed, isolating starting air from the EDG air start motors, making the EDG unable to start on any demand signal.

On May 14, 2018, at 12:30 a.m., since the licensee was unaware that the Division 2 EDG was inoperable and unavailable due to its inability to start caused by the 1DG160 and 1DG161 valves being closed, the licensee began a scheduled maintenance window for the Division 1 4160 Vac bus (1A1). As a result of taking bus 1A1 out of service, the Division 1 EDG was declared inoperable.

On May 17, 2018, at 3:03 p.m., a non-licensed operator performing shift rounds identified that the 1DG160 and 1DG161 valves were closed and reported this condition to the control room. The licensee declared the Division 2 EDG inoperable and investigated the condition.

Corrective Actions: Operations Director memos were sent to the operations shift managers related to accountability and procedure use and adherence. These memos, which were required to be acknowledged by all operations department personnel and briefed by the operations shift managers, covered various administrative procedural requirements including: procedure use and adherence, control of plant equipment, stop work criteria, operations decision making, and operability procedure requirements. The inspectors reviewed an operations director memo from May 18, 2018, “Issue Response Expectation for Clinton Operations Management.” The inspectors also reviewed an operations director memo from May 23, 2018, “Manager Accountability for Performance.” Interviews with operations department personnel indicated personnel were aware of the content of the memos.

The Operations Director and operations department leaders conducted face-to-face discussions with each member of the operations department.

Just-in-time training was given to all operations department staff on the requirements of HU–AA–104–101, “Procedure Use and Adherence,” Revision 5. The inspectors’ Interviews with operations personnel indicated that personnel were aware of the requirements of HU–AA–104–101.

The licensee changed the clearance and tagging method to include signed restoration steps. Restoration steps were previously included as restoration instruction "notes." These notes were expected to be completed as a procedure; however, the clearance order was allowed to be closed without documenting that these restoration steps had been completed. The inspectors reviewed several clearance orders and verified the licensee's corrective action was being implemented.

The licensee implemented a "Procedure-in-Progress" program for procedures that are not completed within one shift. The inspectors toured the control room and discussed the process with operators and observed it was being implemented.

The licensee conducted a three day stand-down with all station personnel and covered case studies and learnings from the event. The inspectors reviewed the material covered during the stand-down and interviewed plant personnel, who were aware of the details of the stand-down.

The licensee revised the equipment operator rounds points to include logging emergency diesel generator starting air manifold pressures, located down-stream of the air tank isolation valves. The inspectors reviewed the revised 'C' area rounds points and verified operators were logging EDG air manifold pressures.

Operations shift managers were reviewing logs and at least two completed procedures at the end-of-each shift. The inspectors requested to review any condition reports associated with these reviews and were informed that since this had been implemented, there had been no condition reports generated as a result of these shift manager reviews.

Corrective Action Reference: Action Request (AR) 4138790, "Division 2 DG Air Receiver Found Isolated Rounds," dated May 17, 2018.

Performance Assessment:

Performance Deficiency: The licensee failed to perform activities affecting quality in accordance with prescribed procedures and work instructions as required by 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," that resulted in the unavailability of the Division 2 EDG when it was relied upon for plant safety. Specifically, the licensee failed to:

Perform CPS 3506.01P002, "Division 2 Diesel Generator Operations," Revision 3a, in conjunction with the removal of C/O 139455 as required by the C/O restoration instructions on May 9, 2018.

Perform OP–AA–108–103, "Locked Equipment Program," Revision 2, Step 4.1.5, which stated, "If plant conditions require a locked component to be positioned in a manner other than that indicated on the locked equipment checklist or approved procedure, then UNLOCK and REPOSITION equipment in accordance with OP–AA–108–101, 'Control of Equipment and System Status.'" Valves 1DG160 and 1DG161 were normally locked open valves. Licensee procedure OP–AA–108–101, "Control of Equipment and System Status," Revision 14, Step 4.1.1.1, stated, "Utilize an ACPS [abnormal component positioning sheet] for aligning equipment outside of routine operations. For situations, excluding routine operation, where a component, system, or structure is required to be placed in a position differing from its normal lineup, the alignment must be done utilizing an Abnormal Component

Position Sheet. The ACPS will document proper evaluation, performance and restoration of the alignment, ensuring plant configuration control is maintained."

Perform OP–AA–108–106, "Equipment Return to Service," Revision 5, Step 4.3, which required that "if equipment will not be restored to the Equipment Line-up/Restoration position or the original condition, then another approved equipment status control mechanism shall be used to document equipment status (i.e. Equipment Status Tag, administrative clearance/tagout). Procedure OP–AA–108–101, 'Control of Equipment and System Status,' shall be used to document abnormal equipment configuration and shall be immediately applied following equipment restoration." In addition, neither Step 4.4.9 of OP–AA–108–106 which stated, "Applicable Operating Procedures are complete and any equipment line-ups directed to be completed by the Operating Procedures are completed," nor Step 4.4.14, which stated, "The system/equipment has been walked down as appropriate to verify that it can be safely operated to fulfill its design function," were completed as required.

Perform OP–AA–109–101, "Clearance and Tagging," Revision 12, Step 10.2.1, which stated, "If a lift position is determined to be different from the normal lineup position for the present plant condition and not tracked by another C/O or procedure, then Shift Management shall be notified and equipment tracking initiated." In an interview between the inspectors and SRO 1, he stated that he thought the positions of 1DG160 and 1DG161 were being tracked via a procedure (CPS 3506.01P002). Licensee operations management stated that entering the procedure into the operations log was not the same as tracking via procedure.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the configuration control attribute of the Mitigating Systems Cornerstone and its objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to follow the above station procedures/work instructions resulted in the unavailability of the Division 2 EDG when it was relied upon for plant safety in a shutdown condition.

Significance: The inspectors evaluated the finding against the guidance of IMC 0609 Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings." The finding impacted the Mitigating Systems Cornerstone, specifically the Electric Power Availability Safety Function. The finding represented a loss of system safety function for the EDGs for greater than its TS 3.8.2, Condition B.3, allowed outage time of Immediately which required a phase 2 Appendix G evaluation.

The phase 2 evaluation was conducted using IMC 0609 Appendix G, Attachment 3, and "Phase 2 Significance Determination Process Template for BWR during Shutdown." A Region III senior reactor analyst (SRA) completed the phase 2 evaluation and concluded that a phase 3, or detailed risk evaluation, would be needed to refine the phase 2 evaluation.

For the phase 2 evaluation, the applicable initiating event was a loss of offsite power (LOOP) event. The phase 2 evaluation focused on the 3 day exposure period in which both EDGs were unavailable and the plant was in plant operating state (POS) 1, with the reactor vessel head installed. The full exposure period for the finding is approximately 6 days. During the first 3 days, the Division 1 EDG remained available. The time to boil was approximately 5 hours and the time to uncover the core was approximately 12 hours, based on information provided by the licensee during the NRC's Management Directive (MD) 8.3 evaluation of the condition.

To solve the phase 2 worksheet for a loss of offsite power in POS 1, the following assumptions were made:

The LOOP initiating event likelihood (IEL) was assigned a value of “3” consistent with an exposure time of less than 3 days. Although the actual time that both EDGs were unavailable was slightly over 3 days, the SRA determined that it would be overly conservative to use the IEL for an exposure time of 3 to 30 days.

The emergency AC power function was assigned a value of “0” because neither EDG was available.

The recovery of LOOP in 20 hours was assigned a value of “2” which is the maximum value used in phase 2 of the shutdown SDP. The function represents the recovery of AC power after battery depletion with successful injection from an AC-independent source.

The AC-independent injection before core damage (ACI) function was assigned a value of “3,” the maximum value used in phase 2, to represent the potential to use an AC power independent source of injection such as the permanently installed diesel-driven fire pump. The inspectors and the SRA determined that other plant-specific options to mitigate the event were more likely to be used by operators. The plant-specific options included the use of the Division 3 EDG to power Division 2 equipment or FLEX equipment.

The recovery of LOOP in 8 hours was assigned a value of “1,” the maximum value used in phase 2.

Recovery of the Division 2 EDG was assigned a value of “1,” the maximum value used in phase 2. The inspectors determined that annunciator response and operating procedures would direct actions to restore the air receiver outlet valves to the open position.

Using the assumptions above, the two core damage sequences were solved with a value of “6” and “8,” representing an overall delta core damage probability (CDP) in the range of E–6. The dominant core damage sequence is a LOOP event, no emergency AC power, successful AC-independent injection, but failure to recover offsite power in 20 hours (after battery depletion but before core damage).

A phase 3 SDP evaluation will be performed to further evaluate recovery of the Division 2 EDG, plant-specific mitigating system strategies such as the Division 3 cross-tie to Division 2, use of FLEX, and the recovery of offsite power. As a result the significance of this finding is to be determined (TBD).

Cross-cutting Aspect: The finding had a cross-cutting aspect in the Field Presence component of the Human Performance cross-cutting area, which states that Leaders are commonly seen in the work areas of the plant observing, coaching, and reinforcing standards and expectations. Deviations from standards and expectations are corrected promptly. Senior managers ensure supervisory and management oversight of work activities, including contractors and supplemental personnel. Specifically, the operators controlling the return to service of the Division 2 EDG were not properly coached to ensure that procedures required to maintain configuration control of the Division 2 EDG were carried out to ensure that it became and remained operable and available when relied upon for nuclear safety. (H.2)

Enforcement:

Apparent Violation: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by documented procedures of a type appropriate to the circumstances and be accomplished in accordance with these procedures.

Clearance Order 139455 instructions required the performance of CPS 3506.01P002, "Division 2 Diesel Generator Operations," Revision 3a, in conjunction with the removal of out-of-service tags on May 9, 2018.

Procedure OP–AA–108–103, "Locked Equipment Program," Revision 2, Step 4.1.5, stated, "If plant conditions require a locked component to be positioned in a manner other than that indicated on the locked equipment checklist or approved procedure, then UNLOCK and REPOSITION equipment in accordance with OP–AA–108–101, "Control of Equipment and System Status." Procedure OP–AA–108–101, "Control of Equipment and System Status," Revision 14, Step 4.1.1.1, stated, "Utilize an ACPS for aligning equipment outside of routine operations."

Procedure OP–AA–108–106, "Equipment Return to Service," Revision 5, Step 4.3, required that "if equipment will not be restored to the Equipment Line-up/Restoration position or the original condition, then another approved equipment status control mechanism shall be used to document equipment status (i.e. Equipment Status Tag, administrative clearance/tagout). Procedure OP–AA–108–101, 'Control of Equipment and System Status,' shall be used to document abnormal equipment configuration and shall be immediately applied following equipment restoration."

Procedure OP–AA–108–106, "Equipment Return to Service," Revision 5, Step 4.4.9, which stated, "Applicable Operating procedures are complete and any equipment line-ups directed to be completed by the Operating Procedures are completed."

Procedure OP–AA–108–106, "Equipment Return to Service," Revision 5, Step 4.4.14, stated, "The system/equipment has been walked down as appropriate to verify that it can be safely operated to fulfill its design function."

Procedure OP–AA–109–101, "Clearance and Tagging," Revision 12, Step 10.2.1 stated, "If a lift position is determined to be different from the normal lineup position for the present plant condition and not tracked by another C/O or procedure, then the Shift Management shall be notified and equipment tracking initiated."

Technical Specification 3.8.2, "AC Sources-Shutdown," Condition B.3, states, in part, that an inoperable EDG be restored to an operable status immediately.

Between May 9 and May 17, 2018, the licensee apparently failed to:

Perform CPS 3506.01P002, "Division 2 Diesel Generator Operations," Revision 3a, in conjunction with the removal of C/O 139455 as required by the C/O restoration instructions.

Perform OP–AA–108–103, "Locked Equipment Program," Revision 2, Step 4.3, valves 1DG160 and 1DG161 were normally locked open valves and an ACPS was not utilized to track valve status.

Perform OP–AA–108–106, “Equipment Return to Service,” Revision 5, Step 4.3, when valves 1DG160 and 1DG161 were left in an abnormal position an approved equipment status control mechanism was not used to track equipment status. Perform OP–AA–108–106, “Equipment Return to Service,” Revision 5, Step 4.4.9, when the equipment was declared operable the applicable operating procedure CPS 3506.01P002 had not been completed and equipment line-ups directed to be completed by the operating procedures were not completed. Perform OP–AA–108–106, “Equipment Return to Service,” Revision 5, Step 4.4.14, when the system was declared operable without being walked down. Perform OP–AA–109–101, “Clearance and Tagging,” Revision 12, Step 10.2.1, when the lift position was different from the normal lineup for the present plant condition and equipment tracking was not initiated. Additionally, because the licensee was not aware of the EDG’s inoperability the required action in TS 3.8.2, Condition B.3 was not followed. Disposition: The disposition of this violation is TBD.

(5) Understand whether there were any deficiencies in operator training (both licensed and non-licensed operators) which contributed to the EDG unavailability and the failure to identify the condition across multiple operating shifts.

Observation	IP 93812
The inspectors reviewed training materials and had discussions with training management about the training program aspects and topics related to the event for the previous 2 years. Training related to configuration control, including clearance and tagging processes used at CPS, was given in formal classroom training sessions during initial training for equipment operators (EOs), reactor operators (ROs), and SROs. Additional training on the implementation of configuration control procedures was given during initial qualifications and continuing training as "on-the-job" training. Passport was the software program used at CPS for implementing the clearance and tagging program. Similar to configuration control, the licensee gives initial training to operators on the use of Passport, and additional training related to Passport is considered on-the-job training. The inspectors did not identify any formal continuing training related to configuration control that was conducted in the previous 2 years, with the exception of one lesson related to clearance and tagging. The inspectors determined that the initial training material reviewed covered the requirements of station administrative procedures for configuration control. However, based on inspector discussions with SROs and members of the root cause team, the inspectors determined that SROs believed that component configuration was allowed to be tracked in the logs. This practice had been normalized at CPS. The practice of tracking configuration of components in the narrative log was not in accordance with any procedural guidance reviewed by the inspectors. The knowledge gap between what was allowed by approved processes and procedures versus the actual methods and standards that CPS had been implementing was addressed in immediate station corrective actions that were implemented following this event. Corrective actions taken by the licensee are discussed in Section (7) of this report.	

Additionally, the inspectors reviewed training materials and held discussions with training management related to training of equipment operators associated with plant tours and general area observations (i.e. "operator rounds"). The inspectors confirmed the equipment operators are given both initial and continuing training related to operator rounds performance standards. Inspector reviews and discussion with training management indicated a thorough training program related to operator rounds. The inspectors did not conclude that training deficiencies for equipment operators contributed to this event; however, the inspectors were concerned that equipment operators' standards for thorough tours, attention to detail in the plant, perceived time pressure, and understanding of plant status were contributors to the event.

Failure to Promptly Identify a Condition Adverse to Quality			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000461/2018050–02 Open/Closed	[H.12] – Human Performance, Avoid Complacency	93812–Special Inspection

On May 17, 2018, a Green finding and an associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," were self-revealed for the licensee's failure to promptly identify that the safety-related Division 2 EDG had its starting air receivers isolated, which was a condition adverse to quality that rendered the EDG inoperable and unavailable.

<u>Description</u>:

On May 11, 2018, at 2:30 a.m., the licensee declared the Division 2 EDG available following the removal of a clearance order supporting maintenance; at 8:00 a.m. on May 12, 2018, the licensee declared the Division 2 EDG operable. On May 14, 2018, the Division 2 EDG was put into a protected status for maintenance on the Division 1 EDG, when the Division 2 EDG would be the only source of emergency power available to the station. On May 17, 2018, at 3:03 p.m., an equipment operator on rounds found the two starting air receiver isolation valves, 1DG160 and 1DG161, in the closed position, which prevented starting air from reaching the Division 2 EDG, and the licensee declared the Division 2 EDG inoperable and unavailable.

After the licensee declared the Division 2 EDG available on May 11, 2018, the licensee performed area rounds checks of the Division 2 EDG room at least once per shift. From May 11 through May 17, 2018, five different equipment operators performed 'C' area rounds checks, which included the D2 EDG room. Those five operators had at least 12 opportunities to identify the problem before it was finally found. The licensee's failure to promptly identify the isolated valves resulted in the plant being in an elevated risk condition that was not allowed by plant procedures for three and one half days without their knowledge.

On May 17, 2018, at approximately 5:35 p.m., a sixth equipment operator identified that isolation valves 1DG160 and 1DG161 were in the closed position and reported them to the control room. The inspectors interviewed the operator that found the valves in the closed position and he stated that it was obvious that the valves were in the wrong position as soon as he entered the room. During a tour of the diesel room, the inspectors noted the relative large size of the air receiver isolation valves (2 inch ball valves with a handle approximately 6 inches long) that were located at knee level while standing on the platform adjacent to the air receivers and were also strapped in the closed position by long black plastic straps. The inspectors also noted that there were two indications for air manifold pressures on each of the two local EDG panels in the Division 2 EDG room. At the time of the event these air manifold pressure gages read zero psig which was a clear indication that there was no starting air pressure available to the Division 2 EDG.

The inspectors conducted interviews with licensee personnel, reviewed the licensee's procedure for operator rounds, toured the Division 2 EDG room, and concluded that it was reasonably within the licensee's ability to identify the condition of the Division 2 EDG prior to return to service and during several opportunities following return to service, during normal equipment operator rounds. Considering all of the information reviewed, the inspectors determined that the licensee did not promptly identify this condition adverse to quality when it was reasonably within their ability to do so.

Normally, items found by the licensee while conducting operator rounds would be considered licensee identified in accordance with IMC 0612, "Issue Screening." However, Block 5 of IMC 0612, Appendix B, states that past experience, related precedents and the over-arching regulatory message should be considered when determining a finding's identification credit. After careful consideration of the above items, the inspectors characterized the finding as self-revealing to align with the NRC's over-arching message regarding the need for improved operation department performance.

Corrective Actions: The licensee placed valves 1DG160 and 1DG161 into their correct position and performed a valve lineup of the Division 2 EDG system. Subsequent corrective actions included adding the EDG air start manifold pressure indications to the 'C' area rounds points log.

Corrective Action Reference: Action Request 4138790, "Division 2 DG Air Receiver Found Isolated Rounds," dated May 17, 2018

Performance Assessment:

Performance Deficiency: The inspectors determined that the licensee's failure to promptly identify the Division 2 EDG air start receiver isolation valves were not in the correct position was a performance deficiency.

Screening: The inspectors determined this issue was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Human Performance and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee, including multiple equipment operators, failed to promptly identify a condition adverse to quality, when multiple indications were available, that indicated the Division 2 EDG was inoperable and unavailable when it was being relied upon as a source of emergency power. As a result, the Division 2 EDG was not capable of responding to initiating events such as a loss of offsite power which placed the plant in an elevated risk condition.

Significance: The inspectors evaluated the significance of the finding using IMC 0609, Appendix G, Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings, Exhibit 3, Mitigating Systems, and determined the finding screened as having very low safety significance (Green) because all of screening questions were answered "no". Specifically, the failure to promptly identify the valves in the wrong position was not considered to be the proximate cause of the valves being in the wrong position.

Cross-cutting Aspect: The finding had a cross-cutting aspect in the Avoid Complacency component of the Human Performance cross-cutting area, which states that individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools. Specifically, equipment operators that toured the Division 2 EDG room on multiple occasions did not identify the latent issues that existed on the EDG and did not implement appropriate human performance tools to conduct intrusive tours of the EDG room with a questioning attitude and attention to detail. (H.12)
Enforcement: Violation: Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that conditions adverse to quality, such as failures, deficiencies, deviations, and non-conformances are promptly identified. Contrary to the above, from May 11 to May 17, 2018, the licensee failed to promptly identify a condition adverse to quality. Specifically, over the course of 6 days, the safety-related Division 2 EDG starting air receivers were isolated from the EDG air start motors, while it was relied upon for plant safety, which was a condition adverse to quality that rendered the EDG inoperable and unavailable. Disposition: This violation is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.

Equipment Operator Rounds Points Inadequate Acceptance Criteria			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000461/2018050–03 Open/Closed	[H.6] – Human Performance, Design Margins	93812–Special Inspection
On May 17, 2018, a Green finding and an associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," were self-revealed for the licensee's failure to include appropriate quantitative acceptance criteria for the Division 2 EDG parameters to ensure the Division 2 EDG could perform its safety function.			
Description: On May 11, 2018, at 2:30 a.m., the licensee declared the Division 2 EDG available; at 8:00 a.m. on May 12, 2018, the licensee declared the Division 2 EDG operable. On May 17, 2018, at 3:03 p.m., an equipment operator on rounds in the field found the two air receiver isolation valves, 1DG160 and 1DG161, in the closed position and the licensee declared the Division 2 EDG inoperable and unavailable. During the review into this issue, the licensee noted that the EDG air start manifold pressures were not a recorded value in the 'C' area round points performed by equipment operators. The inspectors were concerned that the 'C' area rounds points did not contain readily available information (air start manifold pressures) that would provide an indication of the EDGs ability to perform its safety function. With the air start tanks isolated, the air start manifold pressures read 0 psig which would have provided an additional indication that the diesel was not available to start.			

Corrective Action: On May 29, 2018, during the root cause investigation, the licensee revised the ‘C’ area rounds points to include EDG air start manifold pressure indications on the local EDG control panels. Corrective Action Reference: Action Request 4138790, “Division 2 DG Air Receiver Found Isolated Rounds,” dated May 17, 2018
Performance Assessment: Performance Deficiency: The inspectors determined that the licensee’s failure to include the Division 2 EDG air start manifold pressures in the ‘C’ area rounds points was a performance deficiency. Screening: The inspectors determined this issue was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, by not including the air start manifold pressures in the operator round points, the licensee failed to recognize the Division 2 EDG was inoperable when it was being relied upon as a source of emergency power. Significance: The inspectors evaluated the significance of the finding using IMC 0609, Appendix G, Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings, Exhibit 3, Mitigating Systems, and determined the finding screened as having very low safety significance (Green). The failure to have the air manifold pressures in the rounds points was not considered to be the proximate cause of the valves being in the wrong position. Cross-cutting Aspect: The inspectors determined the finding had a cross-cutting aspect of Design Margin in the Human Performance area, which states that the organization operates and maintains equipment within design margins and special attention is placed on maintaining safety related equipment (WP.2). Specifically, the operator round points which did not include the EDG air start manifold pressures failed to verify the EDG could maintain its safety function. (H.6)
Enforcement: Violation: Title 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions and procedures shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. The licensee established the ‘C’ area round points as the implementing procedure for logging Division 2 EDG parameters to ensure its ability to perform its intended safety function, an activity affecting quality. Contrary to the above, prior to May 29, 2018, the licensee’s ‘C’ area rounds points failed to include appropriate quantitative acceptance criteria for the Division 2 EDG parameters to ensure the Division 2 EDG could perform its safety function. Disposition: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

(7) Evaluate licensee planned and completed corrective actions following the EDG event to the extent possible and assess if prior opportunities (e.g., surveillances, maintenance, and self or nuclear oversight assessments) existed to have identified the problem at an earlier point in time.

Observation	IP 93812

At the time of this inspection, the licensee had not completed their root cause evaluation; however, the inspectors reviewed the following immediate corrective actions taken by the licensee:

- Operations director memos were sent to the operations shift managers related to accountability and procedure use and adherence. These memos, which were required to be acknowledged by all operations department personnel and briefed by the operations shift managers, covered various administrative procedural requirements including: procedure use and adherence, control of plant equipment, stop work criteria, operations decision making, and operability procedure requirements. The inspectors reviewed an operations director memo from May 18, 2018, “Issue Response Expectation for Clinton Operations Management.” The inspectors also reviewed an operations director memo from May 23, 2018, “Manager Accountability for Performance.” Interviews with operations department personnel indicated personnel were aware of the content of the memos.
- The operations director and operations department leaders conducted face-to-face discussions with each member of the operations department.
- Just-in-time training was given to all operations department staff on the requirements of HU–AA–104–101, “Procedure Use and Adherence,” Revision 5. The inspectors' Interviews with operation's personnel indicated that they were aware of the requirements of HU–AA–104–101.
- The licensee changed the clearance and tagging method to include signed restoration steps. Restoration steps were previously included as restoration instruction "notes." These notes were expected to be completed as a procedure; however, the clearance order was allowed to be closed without documenting that these restoration steps had been completed. The inspectors reviewed several clearance orders and verified the licensee's corrective action was being implemented.
- The licensee implemented a "Procedure-in-Progress" program for procedures that are not completed within one shift. The inspectors toured the control room and discussed the process with operators and observed it was being implemented.
- The licensee conducted a three day stand-down with all station personnel and covered case studies and learnings from the event. The inspectors reviewed the material covered during the stand-down and interviewed plant personnel, who were aware of the details of the stand-down. Revised the equipment operator rounds points to include logging emergency diesel generator starting air manifold pressures, located down-stream of the air tank isolation valves. The inspectors reviewed the revised ‘C’ area rounds points and verified operators were logging EDG air manifold pressures.
- Operations shift managers were reviewing logs and at least two completed procedures at the end-of-each shift. The inspectors requested to review any condition reports associated with these reviews and were informed that since this had been implemented, there had been no condition reports generated as a result of these shift manager reviews.

The inspectors conducted observations and interviews and concluded that the immediate corrective actions taken by the licensee were appropriate, and station personnel were generally aware of the EDG event, its causes, and corrective actions implemented.

The inspectors reviewed Operations Functional Area Audit Report, NOSA–CPS–17–08, dated October 3, 2017. The inspectors reviewed Configuration Control Self-Assessments conducted in 2017 and 2016, under ARs 4026575 and 2664637, respectively. The inspectors reviewed the 2017 Clinton Clearance and Tagging Self-Assessment conducted under AR 4047333. A review of the above items did not identify any gaps noted by nuclear oversight personnel or operations department staff that would have indicated similar issues that lead to the cause the Division 2 EDG inoperability

The inspectors reviewed the Operator Fundamentals Self-Assessment, dated January 29, 2018, under AR 4042011. The inspectors noted that in Recommendation #1 the licensee stated, "Senior Leadership Team [SLT] observations are not entered in the Exelon Observation System in a thorough and consistent manner/ format making it difficult to assess operator fundamental performance related to SLT observations." However, the licensee also concluded that, "the CPS SLT is monitoring and reinforcing operator fundamentals… and meaningful gaps to excellence were identified…" The inspectors also noted that the number of observations documented in the second and third quarters of 2017 dropped to 45 from 138 total in 2015.

The inspectors did not identify any surveillance tests or maintenance activities that would have been able to identify the condition of the Division 2 EDG at an earlier time. However, as previously discussed, the inspectors did note that multiple (5) equipment operators had toured the Division 2 EDG room on several occasions (12) and had the opportunity to identify the condition of the EDG being inoperable.

(8) Determine whether recent internal and external operating experience involving configuration control, risk management and oversight of activities were appropriately evaluated and determine the adequacy of any corrective actions planned or completed.

Observation	IP 93812

There were two operating experience cases that were immediately relevant and available to the licensee. The first was an external operating event that occurred at Grand Gulf in September 2016. In this event alternate decay heat removal was being relied upon by the licensee as a second source of decay heat removal required by the TS. However, cooling to the alternate decay heat removal system had been tagged out-of-service for several weeks.

The licensee was made aware of this event through an industry communication and NRC Information Notice 2018–03, "Operating Experience Regarding Failure To Meet Technical Specification Requirements For Changing Plant Conditions," dated February 26, 2018. This event was discussed with plant management at the Plan of the Day meeting on April 23, 2017. The licensee addressed the NRC Information Notice with AR 4108876, "OPEX: IN 2018–03 Failure To Meet TS For Change Conditions," dated February 27, 2018. The due date for the licensee's response was not until July 13, 2018.

The second was an internal operating event that occurred at Clinton Station between May 24 and September 22, 2016.

On September 22, 2016, when an area operator was on rounds, the position of CO_2 isolation valve to the generator exciter, 1CO609, was questioned when the operator observed that the valve was unlocked. Further investigation determined that 1CO609 was closed with a required position of locked open. A review of controlling documents determined that there was no open documentation controlling this valve for its current position. A line up was completed and 1CO609 was restored to its required locked open position. An evaluation was performed to determine the cause of 1CO609 being left in a position different from its required position. The review concluded that the last time 1CO609 was manipulated was in accordance with C/O 131019 which was hung to support generator inspections during C1R16. Clearance Order 131019 was removed on May 24, 2016, with the position of 1CO609 left in the closed position (per C/O restoration position) and was required to be restored per CPS 3213.01P001, "Placing Turbine Generator Exciter CO2 System in Standby," Section 8.27, as identified in the clearance order special instructions under the restoration instruction.

The licensee determined that the operators failed to follow OP–AA–108–103, "Locked Equipment Program," Revision 2. Specifically, upon clearing of out-of-service tags associated with C/O 131019 valves 1CO609 and 1CO001 were left in the closed position which was abnormal from the required position. Valve 1CO609 was a locked valve left in an abnormal condition and the procedural requirements of OP–AA–108–103 when a locked valve was left in an abnormal position were not followed.

The licensee's corrective actions were to put the valve into its correct position and to require each operator to read a daily order, which was effective from September 30 through October 3, 2016, that discussed the requirements for tracking the status of plant equipment. The daily order stated that equipment status could be tracked in one of five approved methods. One of those methods, an example given by the licensee, was an open procedure and that the open procedure must be documented in the control room log. This was essentially what the SRO told the inspectors happened in the case of the Division 2 EDG air receiver isolation valves. The SRO stated he was required to log the out-of-service activity in the control room logs and he believed that CPS 3506.01P002 was the procedure in progress to control equipment status. The inspectors concluded the licensee's response to the internal operating experience was ineffective and may have actually reinforced the behavior of tracking equipment status using the control room logs which contributed to the EDG air receiver valves being left in the wrong position.

Observation—Licensee Identified Failure to Follow Procedure	IP 93812

The licensee identified a Green finding for the failure to follow licensee procedure OP–AA–103, "Locked Equipment Program," Revision 2. Specifically, the licensee failed to track the status of a locked valve that was left in an abnormal position in accordance with the procedural requirements.

On September 22, 2016, when an area operator was on rounds, the position of CO2 isolation valve to the generator exciter, 1CO609, was questioned. The inspectors gave the licensee identification credit for finding this valve out of position, even though it had been out of position for several months, because the valve was about 10 feet in the air and the valve position was not identifiable from the ground. The operator noticed the valve was not locked, which was difficult to see from the ground, and questioned its position. Further investigation determined that 1CO609 was closed with a required position of locked open. A review of controlling documents determined that there was no open documentation controlling this valve for its current position. A line up was completed and 1CO609 was restored to its required locked open position. An evaluation was performed to determine the cause of 1CO609 being left in a position different from its required position. The review concluded that the last time 1CO609 was manipulated was in accordance with C/O 131019 which was hung to support generator inspections during C1R16. Clearance Order 131019 was removed on May 24, 2016, with the position of 1CO609 left in the closed position (per C/O restoration position) and was required to be restored per CPS 3213.01P001, “Placing Turbine Generator Exciter CO2 System in Standby,” Section 8.27, as identified in the clearance order special instructions under the restoration instruction.

The licensee determined that the operators failed to follow OP–AA–108–103, “Locked Equipment Program,” Revision 2. Exelon procedure OP–AA–108–103, “Locked Equipment Program,” Revision 2, Step 4.1.5, stated, “If plant conditions require a locked component to be positioned in a manner other than that indicated on the locked equipment checklist or approved procedure, then UNLOCK and REPOSITION equipment in accordance with OP–AA–108–101, ‘Control of Equipment and System Status.’” Valves 1DG160 and 1DG161 were normally locked open valves. Procedure OP–AA–108–101, “Control of Equipment and System Status,” Step 4.1.1.1, stated, “Utilize an ACPS [abnormal component positioning sheet] for aligning equipment outside of routine operations.” Specifically, upon clearing of out-of-service tags associated with CO 131019 valves 1CO609 and 1CO001 were left in the closed position which was abnormal from the required position. Valve 1CO609 was a locked valve left in an abnormal condition and an ACPS was not used to track the position of the valve.

Screening: The inspectors determined the performance deficiency was more than minor because it could reasonably be viewed as a precursor to a significant event. Specifically, the failure to effectively correct the above performance deficiency regarding locked equipment left in an abnormal condition eventually resulted in the unavailability of the Division 2 EDG when it was relied upon for plant safety in a shutdown condition.

Significance: The finding affected the Mitigating Systems Cornerstone and was screened in accordance with IMC 0609, Appendix F,” Table 1.2.1., which was answered “no.” The inspectors determined that Step 1.4.2 was answered no and therefore the finding screened as Green.

Corrective Actions: The licensee’s corrective action, at the time, was to put the valve into its correct position and put out a Daily Order, which was good September 30 through October 3, 2016, that discussed the requirements for tracking the status of plant equipment. The licensee documented this event in AR 2718753, “EOID: 1CO609, 1CO01T Tank Outlet Valve Found Open,” September 22, 2018.

Enforcement: The inspectors did not identify a violation of regulatory requirements associated with this finding. The equipment associated with this finding was non-safety related.

EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure. No proprietary information was documented in this report.

- On June 29, 2018, the inspectors presented the initial Special Inspection results to Mr. T. Stoner, Clinton Power Station, Site Vice President and other members of the licensee staff during an interim exit meeting.
- On August 3, 2018, the inspectors presented the final Special Inspection results to Mr. T. Stoner, Clinton Power Station, Site Vice President and other members of the licensee staff during a final exit meeting.

THIRD PARTY REVIEWS

None.

DOCUMENTS REVIEWED

93812—Special Inspection

Paragraph (1)

- Control Room Logs May 5 through May 18, 2018
- AR 04150624; NRCID: C1R18 Risk Log Entries Inconsistent; 06/26/2018
- AR 04150906; Log Discrepancies Found During NRC SIT; 06/27/2018

Paragraph (2)

- C1R18 Shutdown Safety Management Program Safety Analysis; 04/09/2018

Paragraph (3)

- Root Cause Charter for the Event Associated with IR 4138790; Division 2 DG Air Receivers Found Isolated during Rounds; 05/17/2018

Paragraph (4)

- HU–AA–104–101; Procedure Use and Adherence; Revision 5

Paragraph (6)

- AR 04151037; Delete CPS 1409.01 Section 8.5—It Is Out of Date; 06/27/2018
- CO 00139455, Checklist 4; C1R18—4.16kV Bus 1B1 Outage (AP–1B1)
- CPS 1052.01; Conduct of System Lineups; Revision 9a
- CPS 1401.09; Control of System and Equipment Status; Revision 9d
- CPS 1401.09; Control of System and Equipment Status; Revision 9e
- CPS 3506.01P002; Division 2 Diesel Generator Operations; Revision 3a
- CPS 3506.01P002; Division 2 Diesel Generator Operations; Revision 3b
- ER–AA–310; Implementation of the Maintenance Rule; Revision 11
- OP–AA–10; Clearance and Tagging Process Description; Revision 4
- OP–AA–108–103; Locked Equipment Program; Revision 2
- OP–AA–108–105; Equipment Deficiency Identification and Documentation; Revision 11
- OP–AA–108–106; Equipment Return to Service; Revision 5
- OP–AA–108–115; Operability Determinations (CM–1); Revision 20
- OP–AA–109–101; Clearance and Tagging; Revision 12
- OP–AA–111–101; Operating Narrative Logs and Records; Revision 18
- OP–CL–108–101–1003; Operations Department Standards and Expectations; Revision 37
- OU–AA–103; Shutdown Safety Management Program; Revision 20

Paragraph (7)

- Unit 01 Standing Order 2018–06; Prerequisite Steps in Operating Procedures Directing Line-ups; 06/15/2018

- Unit 01 Standing Order 2018–03; Configuration Control Event IR# 04138790; 05/18/2018

Paragraph (8)

Nuclear Plant Plan of the Day Package, dated 04/13/201